Claim Amendments

Please amend the pending claims as follows:

1. (currently amended) An adaptive filter, comprising:

a filter input for receiving a first signal;

a filter output for outputting a second signal based upon said first signal to a summation device;

an error input for receiving an error input signal generated by a comparison of the second signal against a third signal; and

a plurality of ~~first~~ coefficients having a plurality of poles and a plurality of zeroes wherein said ~~first~~ coefficients are determined by deriving a finite impulse response (FIR) filter having a predetermined number of ~~second~~ FIR coefficients, obtaining convergence of said ~~second~~ FIR coefficients, converting said FIR filter into an infinite impulse response (IIR) filter, and updating the zeroes of said ~~first~~ coefficients based upon said error input signal while concurrently maintaining the poles of said ~~first~~ coefficients in a fixed state.

2. (currently amended) The adaptive filter of claim 1 wherein convergence of said ~~second~~ FIR coefficients is achieved using a Least Means Square approach.

3. (currently amended) The adaptive filter of claim 1 wherein updating the zeroes of said ~~first~~ coefficients is achieved using a Least Means Square approach.

4. (currently amended) A method for filtering a signal, comprising the steps of:

deriving, for an infinite impulse response

(IIR) filter, a plurality of ~~first~~ IIR coefficients ~~of an infinite impulse response (IIR) filter~~ wherein said ~~first~~ IIR coefficients have a plurality of poles and a plurality of zeroes and are determined by deriving a filter having a predetermined number of ~~second~~ coefficients, obtaining convergence of the filter, and converting said filter into the IIR filter;

receiving a first signal;

outputting a second signal wherein the second signal is a function of the ~~first~~ IIR coefficients and the first signal;

receiving an error input signal generated by a comparison of the second signal against a third signal; and

updating the zeroes of said ~~first~~ IIR coefficients based upon said error input signal and not updating the poles of said ~~first~~ IIR coefficients.

5. (currently amended) The method of claim 4 further comprising the steps of:

monitoring the error input signal; and

if the error input signal exceeds a predetermined threshold, re-deriving the ~~first~~ IIR coefficients by re-determining the predetermined number of ~~second~~ coefficients of the filter, obtaining convergence of the filter, and re-converting said filter into the IIR filter.

6. (currently amended) The adaptive filter of claim 4 wherein convergence of said ~~second~~ coefficients is achieved using a Least Means Square approach.

7. (currently amended) An echo cancellation system for

canceling echo within a second signal generated by the transmittal of a first signal through a cross-coupling pathway, comprising:

a summation device for summing a third signal and the second signal to produce an error signal; and

an adaptive filter comprising a filter input for receiving the first signal, a filter output for outputting the third signal based upon said first signal to the summation device, an error input for receiving the error signal, and a plurality of ~~first~~ infinite impulse response (IIR) coefficients having a plurality of poles and a plurality of zeroes wherein the zeroes of said ~~first~~ IIR coefficients are updated based upon said error signal and wherein the poles of said ~~first~~ IIR coefficients are maintained in a substantially fixed state[[.]] and wherein said IIR coefficients are determined by deriving a finite impulse response filter (FIR) having a predetermined number of FIR coefficients, obtaining convergence of FIR filter, and converting said FIR filter to derive said IIR coefficients.

8. (canceled)

9. (original) A method for canceling an echo wherein the echo is generated by transmitting a first signal through an echo-causing system, comprising the steps of:

deriving coefficients of an infinite impulse response (IIR) filter wherein said coefficients have a plurality of zeroes and are determined by deriving a finite impulse response (FIR) filter, obtaining convergence of the FIR filter, and converting said filter into the IIR filter;

receiving a first signal;

outputting a second signal wherein the second signal is a function of the coefficients and the first signal;

receiving an error signal generated by a comparison of the second signal against a third signal; and

updating only the zeroes of said coefficients based upon said error signal.

10. (currently amended) A gateway operative to transmit signals between a circuit switched network and a packet based network, comprising:

~~a plurality of digital to analog encoders and decoders; and~~

an echo cancellation device wherein said device comprises a summation device for summing a first signal and a second signal to produce an error signal and an adaptive filter comprising ~~a filter input for receiving a third signal, a filter output for outputting the second signal based upon said third signal to the summation device, an error input for receiving the error signal, and coefficients having a plurality of zeroes wherein only the zeroes of said coefficients are updated based upon said error signal~~. a filter input for receiving a third signal, a filter output for outputting the second signal based upon said third signal, an error input for receiving the error signal, and a plurality of infinite impulse response (IIR) coefficients having a plurality of poles and a plurality of zeroes wherein the zeroes of said IIR coefficients are updated based upon said error signal and wherein the poles of said IIR coefficients are

maintained in a substantially fixed state and wherein said IIR coefficients are determined by deriving a finite impulse response filter (FIR) having a predetermined number of FIR coefficients, obtaining convergence of FIR filter, and converting said FIR filter to derive said IIR coefficients.

11. (currently amended) A multi-channel echo cancellation system for substantially reducing the presence of a plurality of undesired frequencies in a plurality of first signals, wherein said first signals are transmitted across a plurality of channels, comprising:

at least one summation device operative in each of said channels; and

at least one adaptive filter operative in each of said channels wherein each of said adaptive filters has a filter input for receiving a second signal, a filter output for outputting a third signal based upon said second signal ~~to the summation device~~, an error input for receiving an error signal generated by a comparison of the first signal against the third signal, and a plurality of ~~first~~ IIR coefficients having a plurality of zeroes wherein said ~~first~~ IIR coefficients are determined by deriving a filter having a predetermined number of ~~second~~ coefficients, obtaining convergence of said ~~second~~ coefficients, converting said filter into an infinite impulse response (IIR) filter to yield the ~~first~~ IIR coefficients, and updating only the zeroes of the ~~first~~ IIR coefficients based upon said error signal.

12. (currently amended) An adaptive filter, comprising:

a filter input for receiving a first signal;

a filter output for outputting a second signal based upon said first signal ~~to a summation device~~;

an error input for receiving an error signal generated by a comparison of the second signal against a third signal; and

a plurality of ~~first~~ coefficients having a plurality of poles and a plurality of zeroes wherein the zeroes of said ~~first~~ coefficients are updated based upon said error signal and wherein the poles of said ~~first~~ coefficients are maintained in a substantially fixed state[[.]] and wherein the coefficients are initially determined by deriving a finite impulse response (FIR) filter having a predetermined number of FIR coefficients, obtaining convergence of said FIR coefficients, dividing said FIR coefficients into a first set of FIR coefficients and a second set of FIR coefficients, and converting said second set of FIR coefficients into the coefficients.

13. (cancelled)

14. (currently amended) An adaptive filter, comprising:

a finite impulse response (FIR) filter having a plurality of ~~first~~ FIR coefficients wherein said ~~first~~ FIR coefficients are determined by deriving a FIR filter having a predetermined number of ~~second~~ coefficients, obtaining convergence of said ~~second~~ coefficients, dividing said ~~second~~ coefficients into a first set of ~~second~~ coefficients and a second set of ~~second~~ coefficients, and adopting the first set of ~~second~~ coefficients as the ~~first~~ FIR coefficients; and

an infinite impulse response (IIR) filter

having ~~an input for receiving a first signal, an output for outputting a second signal based upon said first signal, an error input for receiving an error input signal generated by a comparison of the second signal against a third signal, and~~ a plurality of ~~third~~ IIR coefficients wherein said ~~third~~ IIR coefficients have a plurality of poles and a plurality of zeroes and are derived from said second set of ~~second~~ FIR coefficients.

15. (currently amended) The adaptive filter of claim 14 wherein the zeroes of the ~~third~~ IIR coefficients are updated based upon ~~said~~ an error input signal.

16. (currently amended) The adaptive filter of claim 14 wherein the poles of the ~~third~~ IIR coefficients are fixed.

17. (currently amended) A channel equalizing system for equalizing signals received in at least one channel, comprising:

an adaptive filter having a filter input for receiving a first signal, a filter output for outputting a second signal based upon said first signal, an error input for receiving an error signal, and a plurality of ~~first~~ infinite impulse response (IIR) coefficients having a plurality of poles and a plurality of zeroes wherein the zeroes of said ~~first~~ IIR coefficients are updated based upon said error signal and wherein the poles of said ~~first~~ IIR coefficients are maintained in a substantially fixed state[[.]] and wherein the IIR coefficients are initially determined by deriving an FIR filter having a predetermined number of FIR coefficients, obtaining

convergence of said FIR coefficients, and converting said converged FIR coefficients into the IIR coefficients.

18. (original) A method for equalizing a channel, comprising the steps of:

deriving coefficients of an infinite impulse response (IIR) filter wherein said coefficients have a plurality of zeroes and are determined by deriving a finite impulse response (FIR) filter, obtaining convergence of the FIR filter, and converting said filter into the IIR filter;

receiving a first signal;

outputting a second signal wherein the second signal is a function of the coefficients and the first signal;

receiving an error signal; and

updating only the zeroes of said coefficients based upon said error signal.